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## More than one crisis: COVID-19 response actors navigating multi-dimensional crises in Flanders, Belgium

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### ABSTRACT

The COVID-19 pandemic has disrupted societies globally. Public health institutions were tasked with responding to the pandemic in a dynamic and uncertain context. This paper sheds light on the experiences of COVID-19 response actors as they navigated multi-dimensional crises associated with the pandemic in general and vaccine hesitancy in particular. This research was conducted during the initial phase of the COVID-19 vaccine rollout in Flanders, Belgium. Participants included informants across all levels of the COVID-19 vaccination strategy including but not limited to those producing scientific knowledge, providing policy input, or implementing public health directives locally. 'Crisis' was identified as a recurring theme in interviews with informants. The paper highlights multi-dimensional crises experienced by informants such as the: (i) crisis of prioritization, (ii) crisis of communication, (iii) crisis of the changing image of science, (iv) crisis of epistemic agency and autonomy, and (v) crisis of trust.

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COVID-19; crisis; vaccination

## Introduction

Attaining high vaccination coverage was considered an effective way of engaging with the COVID-19 pandemic (World Health Organization, 2020). In trying to reach this goal, COVID-19 response actors were confronted with numerous multi-dimensional crises. Etymologically, the term 'crisis' can be traced back to the ancient Greek term κρίσις (krinō) which refers to an 'irrevocable decision' or 'turning point' (Koselleck, 2002, p. 237; Roitman, 2014, p. 3). For the Hippocratic school of medicine, crisis concerned the decisive turning point where the physician had to make a critical life-or-death

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decision with far reaching implications (Jouanna, 2005, p. 4; Koselleck, 2002, p. 237). Similarly during the pandemic, COVID-19 response actors had to make crucial decisions with wide ranging implications as they took on the pivotal role of mobilizing an effective public health response.

The urgency demanded during the pandemic, however, ran counter to the time-intensive scientific validation processes that normally produce the evidence-base for an effective public health response (Carley et al., 2020; Evans, 2022; Eysenbach, 2020; Pearson, 2021; Van Dooren & Noordegraaf, 2020, pp. 611–612). Making matters worse was the recurring tension between public health priorities and those of other domains, such as the economy, where privileging the former was often seen to come at the cost of the latter (Kattumana & Byrne, 2023, pp. 219–222; Leach et al., 2022, p. 89). Despite this, complex decisions with ramifications across multiple domains were expected to be taken with inconclusive evidence. The COVID-19 pandemic, following Funtowicz and Ravetz, constituted a case of *post-normal science* ‘where facts are uncertain, values in dispute, stakes high and decisions urgent’ (Funtowicz & Ravetz, 1993, p. 744).

Making important decisions and acting on them was not limited to a single instance but a constant feature of the pandemic. This points towards another dimension of ‘crisis’. By the 16<sup>th</sup> and 17<sup>th</sup> centuries, the meaning of the term was no longer restricted to a single decisive instance but refers to the ‘intense disruption’ that precedes this moment (Shank, 2008, p. 1092). Furthermore, the term crisis comes to attain a ‘figurative’ usage that can be extended to a decisive stage in any process (1091). These developments result in a crisis no longer concerning a single moment but an overall historical condition that one is living through. Crisis becomes a ‘structural category’ resulting in notions of a ‘permanent crisis’ (Koselleck, 2002, p. 242). Put differently, everyday life starts to be imbued with a persistent or permanent awareness of crises (Freedon, 2017, p. 14). During the pandemic, COVID-19 response actors were confronted by an ever-evolving *dynamic* of around-the-clock moments of persistent crises that required urgent decisions, decisive action with inconclusive evidence, and consequences that exceeded the domain of public health.

This paper focuses on the lived experience of COVID-19 response actors tasked with making important decisions, implementing public health policy, and navigating multi-dimensional crises associated with attaining high vaccination coverage during the COVID-19 pandemic.

## Methodology

### *Study site and population*

This research builds upon data from in-depth interviews (IDI) with COVID-19 response actors during the initial rollout of the vaccination strategy (December 2020 to September 2021) in Flanders, Belgium.

The responsibilities and roles associated with vaccination are divided among several partners in Belgium. Issues such as the purchase and reimbursement of vaccines (including COVID-19 vaccines) are the responsibility of the Federal Minister of Health, while regional ministers for health are responsible for the general vaccination policy and campaigns (Taskforce Operationalization of the vaccination strategy, 2020). Scientific and technical advice is provided by the Superior Health Council to the federal government, and by an expert working group to the regional governments. In Flanders, specific organizations are tasked with vaccinating different target groups (e.g. school children, infants, hard-to-reach populations). Furthermore, a dedicated network of local intermediary organizations is focused on implementing the preventive health policy of the Flemish government. Although the above-mentioned roles were largely maintained during the COVID-19 pandemic, other actors were directly or indirectly involved with COVID-19 vaccination and pandemic prevention (e.g. social and welfare partners, additional advisory groups and task forces collaborating with the government, and academic experts). Additionally, at different points during the pandemic, certain partners were included temporarily (eg. actors involved in mass vaccination centers alongside pharmacies that were included for testing and vaccination). This study involved informants from this ‘extended’ group of COVID-19 response actors.

**Table 1.** Informant categories.

Categories	Description	Number of Interviews
National and regional policy organizations	Concerned with overall vaccine strategy along with providing regulatory and policy input.	5
Scientific and Academic Institutions	Impacting the vaccine rollout through technical advice and media appearances.	7
Media	Influencing public and policy perspectives during the pandemic	1
Intermediary organizations	Setting up collaboration between the different categories and engaging with specific target populations.	9
Implementation partners	Translating policy directives at the local level.	13
<b>Total</b>		<b>35</b>

### Data collection and analysis

Purposive and snowball sampling was used to recruit informants in response to emerging insights from the pandemic and COVID-19 vaccination strategy. Informants were grouped into five categories (Table 1), although these were not always well-defined or easily distinguishable as informants saw their roles being adapted, completely reconceived, or left undefined during, and in response to, the pandemic. Recognizing multiple references to ‘crisis’ in the interviews with the informants presented a way to discuss different categories on a common but *variegated* theme.

The interviews were conducted online in Flemish or English, depending on the participant’s preference, using password protected Zoom meetings due to COVID-19 restrictions. An initial topic guide was developed based on available literature and focused on three themes: (i) the informant and their organization’s experiences of living through, and making decisions, during the pandemic; (ii) public concerns regarding vaccine safety and efficacy; and (iii) the public image of science along with trust in scientific and political institutions. The question guide was continuously adapted based on emerging insights and other components of the research project, e.g. social media analysis of online interactions related to COVID-19 vaccine sentiments and in-depth interviews with various subgroups of the Flemish population. Qualitative content analysis of verbatim interview transcripts was conducted using NVivo© 1.5 software. An initial coding tree was developed, and sub-codes were created inductively to reflect the evolving nature of the issues discussed in the interviews.

The study was approved by the Social and Societal Ethics Committee, KU Leuven (G-2020 12 2032), and the Institutional Review Board of the Institute of Tropical Medicine in Antwerp, Belgium (1436/20).

## Results

Between December 2020 and September 2021, 35 interviews were conducted with COVID-19 response actors (Table 1). The results are presented in terms of five specific crises experienced by the informants.

### Crisis of prioritization

For some informants, the COVID-19 pandemic has been a *crisis of prioritization*. There were periods where COVID-19 issues were given precedence only to be followed by a course correction that shifted attention away to economic or social matters, such as re-opening society. An implementation partner associated with a COVID-19 test center noted that Western societies did not prioritize eliminating SARS-CoV-2:

We can basically choose two out of three: you can choose your economy, you can choose your health, and you can choose your freedom of movement, but you can’t have all three of them. And in the West, in general, we’ve decided not to choose and yeah, just stumble along. (IDI, Implementation partner, April 2021)

The informant claims that the general approach has been to stumble through different priorities. A representative of an intermediary organization working at the interface between municipal governments and implementation partners also recognized the tendency of stumbling along different priorities and identified two contrasting frames that public communication was likely to oscillate between:

One frame, which was really the fear inducing frame, and then you had the other frame which was the normalizing or the minimalizing frame. (IDI, Intermediary organization, March 2021)

When there was a need to prioritize COVID-19-related concerns, the fear-inducing frame was employed to motivate adherence to public health directives by emphasizing a sharp increase in cases or ‘waves’, hospitalizations, and deaths. However, inducing fear was also perceived by the informant to limit public motivation, become overbearing, and eventually result in pandemic-related concerns losing out to other pressing issues. Consequently, there was a shift towards a second, or normalizing, frame where communications stressed the need for society to live with the pandemic and manage its threat to deal with other vital issues.

Moreover, always prioritizing COVID-19-related concerns came at a cost. An informant working at a youth organization noted that prioritizing COVID-19 matters like contact tracing came with an ‘enormous workload’ that inadvertently meant other health promotion and prevention services for young people received less attention or were put on hold (IDI, Intermediary organization, April 2021).

### ***Crisis of communication***

Informants were also confronted with a *crisis of communication* that had multiple aspects: transparency dilemmas, communication difficulties due to the fast pace of the pandemic, and misinformation and media coverage.

### ***Transparency dilemmas***

The urge to be transparent presented two incompatible needs. On the one hand, experts were expected to be entirely transparent with the public. On the other hand, there was an expectation that expert communication would not exacerbate pandemic-related confusions. The incompatibility between these two needs was captured in terms of a paradox by a policy advisor working at the national level:

The more transparent you are, the more data you release, and the more you communicate, the more uncertainty [...] and the more difficult it is for people to grasp, the more critics there will be [...] But on the other hand, if you just keep it within the scientific community, then people say it’s all a black box, and it’s all controlled by Big Pharma, we don’t know what’s going on [...] Yeah, I don’t know how to reconcile the two. But to me, it’s a paradox. I don’t know the answer. (IDI, National and regional policy organization, February 2021)

### ***Communication difficulties amidst the fast pace of the pandemic***

Underlying the above paradox was the presupposition that COVID-19 response actors could limit confusion with well-timed communication. However, this assumes that they themselves were keeping pace with pandemic-related developments. An assumption that could not be taken for granted given the fast pace of vaccine-related developments, the emergence of new SAR-CoV-2 variants, and evolving evidence regarding effective control measures. According to an informant associated with communicating vaccine-related policy, this contributed to a loss of vaccine confidence:

I think that hesitancy is probably linked to a group of factors. The first one is certainly the lack of information, which is our responsibility, but it was a little difficult to be up to date with the moment the vials [of the vaccine] were publicly available, when the vaccine was registered in the UK, and in the US, so it’s very recent that we have the full data. (IDI, National and regional policy organization, December 2020)

The inability to provide timely information also extended to a crisis of communication among, and between, different COVID-19 crisis actors. An implementation partner lamented that efforts to bring general practitioners (GPs) up to speed were a little too late, resulting in GPs feeling left out of the process:

[...] there have been webinars, big webinars to get them [GPs] involved. Yeah, it's a bit late, in fact, [they] should have done this earlier, I think the experts, but they are very busy, and nobody is really paid extra to do this extra work. GPs were a bit forgotten, and they're not used to that. (IDI, Implementation partner, December 2020)

This feeling of 'being late' or 'lagging behind' extended to regional care boards, or organizations that were assigned several municipalities and had the task of coordinating the work of local authorities, healthcare workers, and other partner organizations. One informant of such an organization noted that:

Those organizations [regional care boards], they started with the start of the pandemic, before they were officially recognized [...] it was difficult to set up because they didn't have the chance to start like a regular normal organization, they just had to start and immediately go in this crisis mode. (IDI, Intermediary organization, September 2021)

The pressure to stay up to date was also emphasized by a member of law enforcement who noted that:

It's an ever-changing situation, the numbers go up, they go down, they change the more science is being conducted [...] they said masks don't matter, then the next month masks are very important [...] and so political [institutions] have to change their regulation very quickly and very often to make sure that the pandemic is managed as well as possible. (IDI, Implementation partner, August 2021)

In some cases, the issue was not just the lack of time, but that different expertise was required for different communicative tasks. An informant whose organization was tasked with translating public health directives at the local level noted that there was a need for both communication experts, who understood how to create appropriate content for websites or deal with social media, and those with experience in motivating behavioral change (IDI, Implementation partner, February 2021). In practice, however, COVID-19 response actors were often expected to combine both profiles, despite not always having the required experience or background.

### ***Misinformation and media coverage***

For some informants, work was made more challenging by what they experienced as the public's inability to distinguish misinformation or disinformation from reliable scientific communication. An informant working with the COVID-19 vaccination campaign noted:

I have never before seen (such) levels of propaganda [...] people are overloaded with information. Information that is based on scientific evidence, but also [...] visions of vaccination which are completely irrational. It is hard for people to distinguish what is correct, what is wrong, what is based on science, what is based on nothing [...] They do not make a difference between something which stems from scientific research, evidence, clinical trials, and so on, and what is said by a sportsman, by whatever doctor or whatever network. (IDI, Scientific and Academic Institutions, March 2021)

Several informants were also frustrated with the media. A senior journalist noted that many reporters tasked with communicating on the pandemic had very little experience with science reporting.:

You have a number of people that are really specialized in it [science reporting]. But many of the other reporters actually have very little knowledge and to my great dissatisfaction very often some of these people were sent to a manifestation by Corona skeptics. And to me, it was clear that they didn't know what to ask [...] just gave them [Corona skeptics] a few free quotes, let them say any kind of nonsense without real restriction. So that was a bit of a frustration. (IDI, Media, September 2021)

### ***Crisis of the changing images of science***

Another crisis impacting informants was *the changing image of science*. A prominent image of science is its association with a history of revolutionary successes and factual certainty. While this

image has been questioned and critiqued, it endures and is often mobilized to evoke compliance and confidence in public health measures in particular and science in general. During the pandemic, however, a COVID-19 response actor involved in an advisory role noted that the public image of science was changing. The public witnessed debate, disagreement, and a lack of consensus within the scientific community. Accordingly, this informant argued for keeping debates within the scientific community and only communicating settled science to the public:

What we've done until now is sort of, or at least like before the rise of the Internet, was to keep the debate, the messy science debate out of the public's eye, and only communicate on the very firm, like scientific knowledge [...] in all honesty, I think we should go back to a world where we communicate only to the public what we are sort of certain about, what has gone through one or two or three checks of peer review. (IDI, National and regional policy organization, February 2021)

Motivating this sentiment was a certain type of public reaction to expert disagreement. This reaction follows the strong association between science and certainty. An association that did not cohere with the many disagreements among scientists during the pandemic. The lack of consensus between experts did not reflect certainty but confusion. Thus, leading to the suspicion that experts were not clear themselves:

There's a lot of people as well who just need certainty, and they want to have clear answers. And the fact that there are scientific debates [...] for certain groups of the public this is a sign, 'You see, they don't even know'. (IDI, Scientific and Academic Institutions, January 2021)

A case in point was disagreement regarding masking at the beginning of the pandemic. One of the informants used the example of a Belgian health minister publicly noting that masking was not necessary. This advice would eventually be reversed, and the associated confusion became the 'soil', or basis, for 'mistrust in science' (IDI, Implementation partner, December 2020).

Another aspect of this crisis concerned preconceived notions around scientific neutrality. The close collaboration between science, politics, and the pharmaceutical industry during the pandemic tarnished the image of science as being detached and objective. When discussing how said collaborations impacted the public relationship with scientific institutions, an epidemiologist lamented:

The image that people have of science is not totally right [...] we have so many medications for cholesterol or for whatever disease that is in high-income countries. And this doesn't happen by chance. This happens because we [Western governments] put pressure on these companies to do products that are functional for the people that we are targeting, I can see very well how the government in the Democratic Republic of Congo has no power to make companies produce a right medication for, I don't know, sleeping sickness [...] so I don't think science is one thing. There is also therapy [which] is not just science, right? Its politics, its context, its economy, its many things. (IDI, Scientific and Academic Institutions, December 2020)

By distinguishing between science and therapy, the informant highlights a complex relationship with politics and industry in a manner that prevents the reduction of bio-medical research as a mere extension of politics or business. However, other informants were less enthusiastic about the relationship between science and other sectors. Taking the case of politics, a medical practitioner and policy advisor noted:

Some of our politicians carry a big responsibility for having disrupted the confidence in the official discourse. And I think that the people are right, that it's difficult today to believe what is said because there have been lies for months in this crisis [...] So we have to try as people not coming from the political sector, to be careful about our credibility because my experience in a long life as a medical doctor is that the people understand quite well what's happening [...] there have been lies that people do not forget. (IDI, National and regional policy organization, December 2020)

Put differently, some informants went to extreme lengths to highlight their independence from the industry, while others stressed that collaboration with the pharmaceutical industry was required given the necessity of developing a vaccine at record pace.



### ***Crisis of epistemic agency and autonomy***

Informants perceived a tension amongst the public between those who did not want to partake in pandemic-related confusions and preferred clear guidelines on how to act and others who wanted to make up their own minds on public health directives, resulting in a *crisis of epistemic agency and autonomy*. A representative of a youth organization explained:

I've criticized the government. They were always changing the goal [...] and the rules were changing, more and more strict [...] You don't have to know every rule [...] or the changing rules, you don't have to get them in your head and start panicking because we don't know the rules. (IDI, Implementation partner, June 2021)

However, others required access to original data and related material to make up their own mind. Official sources often did not meet this need, while online disinformation did:

Dis-informative sources will always refer to science. They will put links in their articles and say you can read it here, it's proven [...] very often they do cherry picking [...] just manipulate the results [...] but the tone is always 'science says that we are right. And the mainstream media don't want to tell you because they are sold out. And the scientists that say that it is not true are also sold. But here is the truth. Here are the facts. You can follow the link, you won't because it's too difficult for you, but here is the link.' And so, I think we need a level of reporting that is slightly higher, slightly more scientific. (IDI, Media, September 2021)

This crisis also played a key role in the debate on mandatory vaccination. The risks posed by COVID-19 meant that stricter measures had to be taken to improve vaccine uptake. However, COVID-19 vaccines were not mandatory, and this led to mixed signals: either the health of the population or individual liberty was paramount. An implementation partner collaborating with religious communities wondered if things needed to be framed in such stark terms:

I do think people in general, are conflicted about the rule of individual decision and liberty, and what's right for the community [...] I think somewhere along the line, people have got it in their head that that's an either/or. (IDI, Implementation partner, July 2021)

### ***Crisis of trust***

The *crisis of trust* was a persistent theme. Despite being a small country of 11 million inhabitants, Belgium has nine health ministers with different jurisdictional responsibilities. This number was repeatedly referenced during the interviews to highlight the confusion that followed from constant disagreement on pandemic-response policies. An informant working for a network of intermediary organizations noted that too many debates and disagreements present in the broad view of the public contributed to a loss of trust in the official public health narrative:

Living in Belgium [...] you have so many different political opinions that people are becoming confused [...] a lot of debates [...] and it's confusing for the people. And when you are confused, yeah, you become more resistant, and then there is no trust. (IDI, Intermediary organization, February 2021)

For some informants, such confusion could not be alleviated with better information. An NGO worker noted that better engagement with the public was needed:

On their websites, quite a lot of information is available, but you have to click five or ten times before you find an answer [...] so the accessibility to information is not easy. People have to invest. And still, it's a kind of cold approach. When you talk to people and you listen to them and you answer the questions face to face or in a small group, you give them more space to be heard and they absorb information easier. (IDI, Implementation partner, January 2021)

The importance of ongoing two-way interaction based on trust was highlighted by a representative of an organization working with diverse urban communities. A reservoir of trusting relationships sustained before the pandemic was seen to limit the disruptive force of the pandemic:

I think we already had good trusting relationships. We really invested in our relationships during years before [...] we didn't have to start building them. They were there. And okay, there was maybe a bit disrupted the last year [by the pandemic], but as I told you, I have this Turkish liaison officer, he never stopped going to his contacts [...] So there is not this big disruption [...] So and I think it's very important when you say this, trust-based relationships are crucial. (IDI, Implementation partner, July 2021)

Similarly, it was argued that sustained relationships, rather than correct information, were the way out of a crisis of trust for an informant tasked with vaccinating disproportionately affected populations:

The client who trusts the organization will more rapidly get a vaccination. So, it's a question of trust. They need sometimes – they need a little bit of a push or a trust factor [...] I will have much less success than somebody else who they [already] trust ... then it will be easier for them to jump over that bridge and get the vaccine than just me informing them. (IDI, Implementation partner, January 2021)

These insights were increasingly recognized during the pandemic. Another representative of an organization working in urban areas noted that 'in general the usefulness of additional communication or inclusive communication to target groups has gained in importance' (IDI, Implementation partner, September 2021).

## Discussion

'Vaccine hesitancy' is often employed to refer to crises that arise when faced with 'delay in acceptance or refusal of vaccines' (World Health Organization, 2014, p. 7). However, vaccine hesitancy is a contested category owing to potential confusions that follow from its 'ambiguous', 'multiple, [and] varied operationalizations' (Bussink-Voorend et al., 2022, p. 1639; Larson, 2022; Peretti-Watel et al., 2015, pp. 1, 5). The present paper supplements this research by providing analysis of the concrete crises identified by COVID-19 response actors when working to improve vaccine coverage.

The results emphasize that crises are not domain-specific but bring together multiple domains such as science, politics, culture, economics, and history (Latour, 1993, pp. 1–12). However, many COVID-19 response actors could only be concerned with crises that fell within their purview. Consequently, crises in other domains were overlooked. In some cases, this was because crises in other domains were thought to be the responsibility of others. Such indirect dependence on other actors presupposed a shared understanding and definition of the different crises at hand, a presumption that overlooked the possibility of different actors experiencing and defining crises differently. Decisions emerging from the perspective and role of individual response actors therefore made 'certain things visible and other[s] invisible' and explains why 'some questions are asked, others are foreclosed' during crises like the pandemic (Roitman, 2014, pp. 39, 81). Additionally, as the pandemic unfolded, some informants saw crises they were tasked with losing prominence to crises from other domains. In some cases, this meant taking up new skills and responsibilities which (in) advertently implied diverting attention away from tasks they usually dealt with. Thus, resulting in a *crisis of prioritization*.

Among the new skills and responsibilities that COVID-19 response actors required to take up was the increased need for public engagement. Most informants stressed the importance of transparency. Research shows that lack of transparency is widely seen as contributing to distrust, especially among groups who have been socially/economically marginalized (Grasswick, 2010), and that public trust in expertise around controversial issues is improved with increased awareness and knowledge of institutional practices and processes underlying scientific consensus formation (Oreskes, 2019; Weisberg et al., 2021). However, our results highlight that some COVID-19 response actors felt increased transparency would make matters worse given that many issues were rife with uncertainty during the pandemic. This resonates with scholarship highlighting that exposure to detailed but uncertain data regarding adverse events after

vaccination, as opposed to summary data, negatively affected vaccine acceptance and trust in biomedical institutions (Scherer et al., 2016). Our informants experienced this as a tension during the pandemic, which saw periods of 'data deficit', with less accurate/reliable information than demanded, and periods of information 'oversupply', or 'infodemic', where the public was overloaded with information (Smith et al., 2020; World Health Organization, 2022). Research shows that increased transparency in this context has the potential to mislead, confuse, and/or heighten anxieties (Shelton, 2020). In this regard, O'Neill questions the assumption that increased openness with the public is correlated with improvements in public trust (2002, pp. 134–140). Our results highlight that the challenge of deciding between being transparent or avoiding pandemic-specific consequences of transparency constituted a crucial feature of the *crisis of communication*.

Another feature contributing to the *crisis of communication* was the fast pace of the pandemic alongside misinformation and media coverage. The rapid spread of misinformation or conspiracy theories is not a pandemic-specific phenomenon (Harambam, 2020; O'Connor & Weatherall, 2019), although it was amplified during the COVID-19 pandemic. Pronouncements of 'post-truth condition' preceding the pandemic already highlighted the general inability to keep up with the rapid spread of (mis/dis-)information. A predicament that some scholars identify as being a constituent part of societies in the latter half of the 20<sup>th</sup>, and initial decades of, the 21<sup>st</sup> century (McIntyre, 2018; Oreskes, 2019), while others see it as a historical feature of western culture owing to epistemic democratization in response to the privileging of expert perspectives (Fuller, 2018).

The rapid pace of COVID-19 developments and the spread of misinformation were seen as contributing to a *crisis of the image of science* as the provider of certainty. During the pandemic, considerable attention was geared towards following every development or setback relating to pharmaceutical and non-pharmaceutical interventions against SARS-CoV-2 (lockdowns, social distancing, masking). The traditional process, whereby debates occur within scientific institutions and only settled science would be presented to the public, was no longer at play. As a result, the public entered through the 'back door of science in the making, not through the more grandiose entrance of ready-made science' (Latour, 1987, p. 4). One potential response was to keep unsettled science within scientific institutions and only communicate settled science or univocal policy to the public. However, others have criticized this tendency and called for greater involvement of the public in evolving scientific issues (Green et al., 2022; Martin et al., 2020; Pertwee et al., 2022).

Another aspect of the *crisis of the image of science*, which is not specific to this pandemic, was preconceptions around scientific neutrality. Historically, the involvement of the pharmaceutical industry has been a point of contention for vaccine hesitancy in particular, and trust in bio-medicine in general (Goldenberg, 2021, pp. 133–135). The pharmaceutical industry has been criticized for sometimes overlooking conflicts of interest, ghost-writing research, and undertaking efforts to over-represent positive results while underplaying setbacks in medical journals (Sismondo, 2021, p. 3). However, collaboration with the pharmaceutical industry was necessary for vaccine development at a record pace. Our results show that balancing the need for collaboration alongside independence from industry remains a sensitive issue for informants.

The *crisis of epistemic agency and autonomy* in relation to (mandatory) vaccines has been a historically recurring issue during vaccination campaigns (Durbach, 2005; Kattumana, 2022, p. 644; Spier, 2001). While some childhood vaccinations are mandatory for school entry, adult vaccine mandates tend to be rare, except in some occupational settings such as hospitals and daycare centers (Gostin et al., 2021, p. 532). Making COVID-19 vaccines mandatory can benefit public health by increasing vaccine uptake, but such short-term gains can result in losing public confidence in the long run when vaccination is not widely supported (Gostin et al., 2021, p. 533; Ward et al., 2022). Among the reasons for such negative outcomes is that vaccines operate in the liminal space between an individual's autonomy and social responsibility toward protecting others (Larson, 2020, p. 62).

The *crisis of trust* was often framed as an 'information problem' where a 'better supply of accurate information' would settle confusion; an approach that has limited potential if the underlying drivers

of distrust persist (Kattumana, 2022, pp. 649–651; Pertwee et al., 2022, p. 456). Similarly, our results emphasize that the crisis of trust was better viewed as resulting from an interaction deficit that could be improved by building trusting relationships at the local level. The importance of sustaining trust has been discussed in terms of ‘habitual trust’, an issue that positively contributes to vaccine acceptance (Brownlie & Howson, 2005, p. 227; Bunton & Gilding, 2013). Bildtgård argues that habit is ‘possibly our strongest source of trust’ as most of our everyday practices are based on it, thereby reducing the possibility of surprising outcomes and making choices easier (Bildtgård, 2008, pp. 105–106). Luhmann discusses habitual trust in terms of confidence or those cases where one does not realistically expect to be disappointed (Luhmann, 1988, p. 97). Such confidence is based on a reservoir of previous experiences and can be built through repeated interaction, house visits, and community engagement. In some cases, such a reservoir of trusting experiences was disrupted by the pandemic or was never present among those with a lack of trust in public health initiatives. There was a growing acknowledgment among some informants that establishing a baseline of habitual trust would function as a buffer against the disruptions of the COVID-19 pandemic and future crises to come. In other words, we argue that a baseline of trusting relationships would aid those who were hesitant, or caught amidst confusions related to the pandemic, to vaccinate.

## Limitations

The interviews for this study took place between December 2020 and September 2021. A possible limitation concerns the temporal difference between when the interviews took place and the informant’s experience. Lastly, this study could not incorporate all perspectives actively dealing with the pandemic. Our sample is biased towards implementation partners and lacks representation of politicians or those with specific technical expertise like virologists.

## Conclusion

Crises are multidimensional in character. However, COVID-19 response actors tend to, or might only be able to, identify and respond to certain dimensions of a crisis. Complicating matters was the urgent need for public health interventions to end the crisis across all dimensions. However, this was an impractical expectation as most interventions realistically operate in one, or a few, dimension(s). For these reasons, it is important to avoid framing interventions in terms of solving a crisis, and more practically as potentially transferring the crisis to another dimension. This awareness might equip decision makers to already alert and work with those tasked with dimensions of the crisis where the crisis might transfer to.

A preferable response to the practical limitations of interventions is the practice of epistemic humility where experts or institutional actors acknowledge uncertainty and the limits of expertise. Rather than inhibiting the scope of interventions, the practice of epistemic humility can lead to a disposition that embraces the agency of others as partners ‘who can/do know what we do not’ (Dalmiya, 2016, p. 119). We argue that this leads to a collaborative dynamic that is crucial when engaging with multi-dimensional crises. This resonates with calls for better collaboration between different forms of expertise, and greater involvement of the public (David & Le Dévédec, 2019; Green et al., 2022; Martin et al., 2020).

It is important, however, to stress that increased collaboration is not a solution but a task or project. Our results suggest that successful collaboration requires a baseline of habitual trust. Instances of successful collaboration during the pandemic saw the inclusion of local actors into COVID-19 response initiatives, bringing with them a community-based network of pre-existing habitual trust. In these cases, COVID-19 response actors did not have to forge such networks in the heat of crises. Sustaining and building networks of habitual trust for increased collaboration is among the crucial tasks underlying the ‘social preparedness’ for future pandemics. Further research is needed to identify how trusting relationships with the general public,

and between various COVID-19 response actors can be sustained, financially supported, and improved to efficaciously engage with crises in the future.

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







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